

## REMARKS

### I. Introduction

In response to the Office Action dated March 11, 2004, claims 1, 3, 5 and 6 have been amended. Claims 1-26 remain in the application. Re-examination and re-consideration of the application, as amended, is requested.

### II. Prior Art Rejections

#### A. The Office Action Rejections

On pages 2-3 of the Office Action, claims 1-8 were rejected under 35 U.S.C. §102(c) as being anticipated by Forrest et al., U.S. Patent Publication No. US2003/007719 (Forrest).

Applicants' attorney respectfully traverses the rejections in light of the amendments above and the arguments below.

#### B. Applicants' Independent Claim

Independent claim 1 is directed to a tunable laser source comprising  
a widely tunable semiconductor laser comprised of an active region on top of a thick, low bandgap, single common waveguide layer, wherein both the waveguide layer and the active region are fabricated between a p-doped region and an n-doped region; and  
an electro-absorption modulator integrated into the semiconductor laser, wherein the electro-absorption modulator shares the waveguide layer with the semiconductor laser.

#### C. The Forrest Reference

Forrest describes a photonic integrated circuit comprises a first waveguide with a first mode of light propagating therein and a second waveguide with a second mode of light propagating therein. The first and second modes of light have different effective indices of refraction. A taper formed in the second waveguide facilitates communication of light between waveguides. Each of the first and second waveguides operate to perform at least one of the generating light, detecting light, and transporting light.

#### D. The Applicants' Invention is Patentable Over the References

Applicants' attorney respectfully submits that Forrest US2003/007719 is not a prior art reference against Applicants' invention, because it was filed June 4, 2002, which is later than the

August 29, 2000 filing date of International Utility Patent Application Serial No. PCT/US00/23710 upon which this application is based, and also is later than the September 3, 1999 filing date of U.S. Provisional Application Serial No. 60/152,432 upon which this application claims priority.

Nonetheless, it is noted that Forrest US2003/007719 is a continuation-in-part of U.S. Utility Patent Application Serial No. 09/982,001, filed Oct. 18, 2001, entitled "Twin Waveguide Based Design for Photonic Integrated Circuits," which is a continuation of U.S. Utility Patent Application Serial No. 09/337,785, filed Jun. 22, 1999, entitled "Twin Waveguide Based Design for Photonic Integrated Circuits," now U.S. Pat. No. 6,381,380. Further, it is noted that Forrest US2003/007719 incorporates by reference the parent application and its parent patent. Thus, Applicants' attorney will only address the subject matter described in Forrest 6,381,380, which pre-dates the filing of Applicants' U.S. Provisional Application Serial No. 60/152,432.

The Applicants' invention, as recited in independent claim 1, is patentable over Forrest 6,381,380, because it contains limitations not taught in the reference.

First, it is noted that Forrest 6,381,380 does not teach or suggest an electro-absorption modulator integrated into the semiconductor laser, wherein the electro-absorption modulator shares the waveguide layer with the semiconductor laser.

Further, Forrest 6,381,380 does not teach or suggest a single common waveguide layer. Instead, Forrest 6,381,380 describes two waveguides (an asymmetric twin waveguide (ATG) structure), one over the other, i.e., vertically stacked.

In addition, the two waveguides of Forrest 6,381,380 each have a separate mode, i.e., an odd and even mode each sharing both waveguides, but sharing them unequally. In contrast, the single common waveguide layer of Applicants' invention has a single transverse mode.

Finally, Forrest 6,381,380 does not teach or suggest a "widely-runnable" laser, as is explicitly recited in Applicants' claims.

Thus, Forrest 6,381,380 teaches away from Applicants' invention. Moreover, the various elements of Applicants' claimed invention together provide operational advantages over Forrest 6,381,380. In addition, Applicants' invention solves problems not recognized by Forrest 6,381,380.

Consequently, Applicants' attorney submits that independent claim 1 is allowable over Forrest 6,381,380. Further, dependent claims 2-8 are submitted to be allowable over Forrest 6,381,380 in the same manner, because they are dependent on independent claim 1, and thus contain all the limitations of the independent claim. In addition, dependent claims 2-8 recite additional novel elements not shown by Forrest 6,381,380.

### III. Conclusion


In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited. Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicants' undersigned attorney.

Respectfully submitted,

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